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Resistivity of Zinc Crystals

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A STUDY OF THE MATHEMATICAL DISABILITIES OF STUDENTS PURSUING FIRST YEAR COLLEGE PHYSICS

W. R. Lueck

This study is in progress at the present time and hence the report is concerned only with such aspects as have been completed.

The Compass Survey Test in Arithmetic (Advanced Examination) and the Douglass Diagnostic Test in Elementary Algebra were given to 282 students pursuing freshman physics in five colleges. The disabilities indicated by these tests were classified and tabulated. In addition to the above, the daily, weekly, and other tests given by the instructors in these colleges to the students concerned were obtained and the disabilities indicated thereon were classified and tabulated. Each student also solved a selected list of physics problems. This list was so selected that a student solving all the problems would have to use a high percentage of all the mathematical skills required by a course in freshman physics as determined by previous studies.

The results indicate that many of these students have not at present a mastery of many of the mathematical skills essential to physics problem solving.

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RESISTIVITY OF ZINC CRYSTALS

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(*Abstract*)

The resistivity at 20°C of zinc crystals made of Kahlbaum's purest and of "Spectroscopically Pure" zinc (from New Jersey Zinc Company) is given as a function of direction of current flow relative to the orientation of the crystal lattice. For the Kahlbaum crystals the results are very much more consistent than have previously been obtained and point to a higher ratio of $\rho_{11}/\rho_{\perp}$ than that obtained by Bridgman. The "Spectroscopically Pure" crystals agree in the main with the Kahlbaum, but there are a few

exceptional cases which tend to confirm Bridgman's strain theory. It seems more probable, however, that an explanation can be given in terms of the conditions governing the growth of the crystals.

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ON ATMOSPHERIC ELECTRICITY

C. S. DORCHESTER AND L. W. BUTLER

(Abstract)

An attempt was made during the summer of 1930 to check results claimed by Christofleau, Vincent, and others relating to the effect of atmospheric electricity on the growth of plants. The results were negative. During the course of these experiments, it was found that, except during the very driest part of the summer, the fair weather current was upward, a result which directly contradicts the work of other investigators in other parts of the world. No accurate comparison could be made with Simpson's value or the total currant between earth and air on account of the type of apparatus used.

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MAGNETIC PROPERTIES OF THIN NICKEL FILMS

H. E. MALMSTROM

(Abstract)

Nickel films deposited from a nickel ammonium sulphate solution containing boric acid show decreasing coercive force with decreasing thickness in the range from 140 to 60 mμ. The films are similar to films deposited from the same solution but without boric acid, but are magnetically harder. Nickel films show an ageing effect not found for iron and cobalt. Heating to 100°C accelerates this effect. The effect of tension on the films is studied by measuring at 100°C, in which case the differential expansion of the brass base and the film supplies the tension. The effect is zero for thickness of about 110 mμ and is opposite in sense for thicker and thinner films. This result cannot be explained in terms of the usual effect of tension on bulk nickel.

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